



(10) **Patent No.:** US 9,410,922 B2
(45) **Date of Patent:** Aug. 9, 2016

- (56)
- References Cited**

U.S. PATENT DOCUMENTS

4,384,935	A	5/1983	De Jong	
6,551,499	B1 *	4/2003	Springhorn	G01N 27/419 204/401

(Continued)

FOREIGN PATENT DOCUMENTS

DE	10 2008 007 238	8/2009
DE	102008007238	8/2009

(Continued)

OTHER PUBLICATIONS

International Search Report for PCT/EP2012/068829, dated Jan. 16, 2013

Primary Examiner — Peter Macchiarolo

Assistant Examiner — Nathaniel Kolb

(74) *Attorney, Agent, or Firm* — Norton Rose Fulbright US LLP

(57) **ABSTRACT**

In a method for adjusting a gas sensor having a hollow chamber connected to a measuring gas chamber and having an electrochemical pump cell electrochemically pumping the gas component into or out of the hollow chamber, at least two pumping-in phases are provided in which the gas component is pumped into the hollow chamber by the electrochemical pump cell, and at least two pumping-out phases are provided in which the gas component is pumped out of the hollow chamber by the electrochemical pump cell. On the basis of at least one feature of the pump current during the pumping-out phases (M_{out}), at least one piece of information for adjusting the gas sensor is generated. A parameter regarding the pumping-in is predefined differently in the at least two pumping-in phases.

15 Claims, 3 Drawing Sheets

